

What is claimed is:

1 1. A unified in-building communication method in a communication system
2 connected to a public land mobile network, a public switched telephone network/integrated
3 services digital network, and an Internet protocol network, said method comprising the steps of:

4 forming a common cell area in which a wireless public communication service and a
5 wireless in-building communication service are available in a prescribed local area;

6 connecting a mobile switching center to said public land mobile network;

7 providing communications functions to a registered mobile terminal when said registered
8 mobile terminal is located in said common cell area; and

9 not providing said communications functions to an unregistered mobile terminal, and
10 bypassing said unregistered mobile terminal.

1 2. The method of claim 1, said communication system and said public land mobile
2 network sharing a base station.

1 3. The method of claim 1, said bypassed unregistered mobile terminal sharing a base
2 station of said communication system.

1 4. The method of claim 1, said registered mobile terminal corresponding to an
2 extension telephone of said communication system when said registered mobile terminal is

3 located in said common cell area, said registered mobile terminal not corresponding to said
4 extension telephone when said registered mobile terminal is not located in said common cell
5 area.

1 5. The method of claim 1, said communications functions including voice and data
2 services.

1 6. The method of claim 1, said common cell area corresponding to at least one
2 building.

1 7. The method of claim 1, said common cell area corresponding to an enclosed
2 three-dimensional space.

1 8. The method of claim 7, said space corresponding to a building.

1 9. The method of claim 4, said registered mobile terminal corresponding to a
2 wireless terminal outputting and inputting signals through air, said extension telephone
3 corresponding to a wire telephone outputting and inputting signals through cable.

1 10. The method of claim 1, outputting signals from said registered mobile terminal to
2 at least one antenna mounted in said common cell area, said at least one antenna being coupled to

3 said communication system.

1 11. The method of claim 1, said registered mobile terminal communicating with one
2 selected from among a wire extension terminal and a wireless extension terminal, and said
3 registered mobile terminal wirelessly receives a data service through said Internet protocol
4 network.

1 12. The method of claim 1, said wireless in-building communication service being
2 performed in a single cell so that a handoff does not occur.

3 13. The method of claim 12, wherein for the same service provider, when said
4 registered mobile terminal moves out of said common cell area and moves into said public land
5 mobile network, the handoff does not occur.

1 14. The method of claim 12, wherein for the same service provider, when said
2 registered mobile terminal moves out of said public land mobile network and moves into said
3 common cell area, the handoff does not occur.

1 15. A unified in-building communication apparatus connected to a public land mobile
2 network, a public switched telephone network/integrated services digital network, and an Internet
3 protocol network, said apparatus comprising:

4 at least one in-building repeater forming a public/private common cell in which said
5 public land mobile network and an in-building private wireless network are commonly used;

6 a call manager controlling a wireless call of a registered extension mobile terminal of said
7 in-building private wireless network, controlling operation and maintenance of radio resources,
8 controlling private base station controller resources, and controlling registration and function
9 setup of extension mobile subscriber corresponding to said extension mobile terminal; and

10 a public/private communication service unit being connected to said public land mobile
11 network, said public switched telephone network/integrated services digital network, and said
12 Internet protocol network, said public/private communication service unit performing an
13 incoming/outgoing call from and to an office line and an extension call through an in-building
14 private branch exchange, performing wireless communication of a registered mobile terminal in a
15 base station under control of said call manager, and performing communication of an Internet
16 protocol terminal.

1 16. The apparatus of claim 15, said at least one repeater being connected to an
2 antenna corresponding to a predetermined area, said extension mobile terminal distinguishing a
3 radio wave of said private in-building wireless network from a radio wave of said public land
4 mobile network according to different pilot strength.

1 17. The apparatus of claim 15, said call manager being connected to said
2 public/private communication service unit through a local area network cable.

18. The apparatus of claim 15, said at least one repeater corresponding to a plurality of repeaters.

19. The apparatus of claim 18, said public/private communication service unit comprising:

an Internet protocol-private branch exchange connected to said public switched telephone network/integrated services digital network, a subscriber line interface, and a digital line interface, performing mobile switching on said extension mobile terminal service, and enabling incoming/outgoing calls through an office line and an extension call;

a private base station controller connected to said Internet protocol-private branch exchange and a global positioning system antenna, allocating a vocoder in response to an outgoing call request originated from a mobile station, processing a test call at an operator's request, and processing a circuit mode data call and a packet mode data call in addition to a voice call; and

a private base transceiver subsystem connected to said private base station controller, performing call processing control on a service associated with a code division multiple access system, said private base transceiver subsystem being connected to said plurality of repeaters having different pilot strengths, such that said extension mobile terminal can acquire a base station of said in-building wireless network.

1 20. The apparatus of claim 19, said private base transceiver subsystem performing a
2 handoff power-up function in accordance with Telecommunications Industry
3 Association/Electronics Industries Association Interim Standard 95-B air interface specification.

1 21. The apparatus of claim 20, said code division multiple access system
2 corresponding to a code division multiple access V.2 system.

1 22. The apparatus of claim 21, said private base station controller and said private
2 base transceiver subsystem employing a code division multiple access technique.

1 23. An apparatus, comprising:

2 at least one in-building repeater forming a public/private common cell in which a public
3 land mobile network and an in-building private wireless network are operating and available;

4 a call manager controlling a wireless call of a registered extension mobile terminal of said
5 in-building private wireless network, controlling operation and maintenance of radio resources,
6 controlling private base station controller resources, and controlling registration and function
7 setup of extension mobile subscriber corresponding to said extension mobile terminal; and

8 a public/private communication service unit being connected to said public land mobile
9 network, a public switched telephone network/integrated services digital network, and an Internet
10 protocol network, said public/private communication service unit performing an
11 incoming/outgoing call from and to an office line and an extension call through an in-building

12 private branch exchange, performing wireless communication of a registered mobile terminal in a
13 base station under control of said call manager, and performing communication of an Internet
14 protocol terminal.

1 24. The apparatus of claim 23, said apparatus corresponding to a unified in-building
2 communication apparatus connected to said public land mobile network, said public switched
3 telephone network/integrated services digital network, and said Internet protocol network.

1 25. The apparatus of claim 23, said public land mobile network corresponding to a
2 wireless public communication service.

1 26. The apparatus of claim 23, said apparatus providing communications functions to
2 said registered extension mobile terminal located in said public/private common cell.

1 27. The apparatus of claim 26, said apparatus not providing communications
2 functions to an unregistered mobile terminal located in said public/private common cell.